IN THE CLAIMS:

1.-29. (Cancelled)

30. (Currently Amended) A system for monitoring a household electric appliance being a washing machine, the monitoring system comprising:

       i.   a read and write memory storing a plurality of measurements of a plurality of physical quantities relating to the household electric appliance within a predetermined time period during a treatment cycle, the storing of a last measured value of a physical quantity causing the deletion of a first measured value within said plurality of measurements in the read and write memory;

      ii.   a first interface means to connect to one or more sensors for measuring said plurality of physical quantities of the household electric appliance, including one or more internal sensors for measuring internal physical quantities and one or more external sensors for measuring external physical quantities;

     iii. a dedicated communication network having a coupling to ~~an~~ at least one of said external physical sensor~~s~~, said network being coupled externally of the washing machine to the first interface means;

     iv. a means for measuring at least one electric quantity by measuring an electric current running through the monitoring device;

     v.   a storage means containing one or more predefined values of ~~the~~ at least one of said plurality of physical quantit~~ies~~ies;

     vi. a microcontroller to process a particular combination of ~~at least one~~ said plurality of physical quantit~~ies~~y and at least one electric quantity to determine an actual combination of the internal physical quantities, one or more external physical quantities or both and one or~~e~~ more of said at least one electrical quantity ~~more electrical quantities~~ at an instant in time, the microcontroller being further configured to

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27 compare said actual combination to one or more respective predefined

28 values contained in the storage means to determine at least one piece

29 of information<u>,</u>- each predefined value being a threshold value against

30 which an actual value is compared to determine a proper operation of a

31 particular component of the appliance at that instant in time<u>;</u>

32 vii. <u>said microcontroller being further configured to adapt the operation of</u>

33 <u>the household appliance based upon data detected by said internal and</u>

34 <u>external sensors</u>; and

35 ~~vii.~~<u>viii.</u> a second interface means to send the at least one piece of information

36 to a remote center for storage.

1 31. (Currently Amended) The monitoring ~~device~~ <u>system</u> as in claim 30, further

2 comprising:

3 a wireless communication device within the first interface means, the wireless

4 communication device communicating with at least one internal sensor within the

5 household electric appliance where the at least one internal sensor measures a physical

6 quantity of an internal part of the household electric appliance; said wireless

7 communication device also adapted to function as the dedicated communication network

8 that couples the external sensors that sense the external physical quantities to said first

9 interface means, and further to report electrical measurements; and

10 the microcontroller being adapted to further process the measurements received

11 from the wireless communication device.

1 32. (Cancelled)

1 33. (Currently Amended) The monitoring ~~device~~ <u>system</u> of claim 30, further comprising:

2 a timing unit, where the timing unit determines time to be associated with the

3 measurements of the one or more physical quantities and at least one electric quantity.

34. (Currently Amended) The monitoring ~~device~~ system of claim 30, wherein the at least one electrical quantity includes at least one of: momentary electric current drawn by the household electric appliance, line voltage applied to the household electric appliance, momentary electric power drawn by the household electric appliance, electric energy consumption of the household electric appliance within a predefined time period, a power factor of the load represented by the household electric appliance, cos(Φ) of the load represented by the household electric appliance, and type of reactive power of the load represented by the household electric appliance.

35. (Currently Amended) The monitoring ~~device~~ system of claim 30, wherein the first interface is connected to the one or more sensors through a wireless connection.

36. (Currently Amended) The monitoring ~~device~~ system of claim 30, wherein the second interface means is connected to the remote center through a wireless connection.

37. (Currently Amended) The monitoring ~~device~~ system of claim 41, wherein the household electric appliance includes one of: a clothes dryer, a washing/drying machine, a dishwasher, a refrigerator, a freezer, a refrigerator/freezer, an electric oven, a gas oven, a microwave oven, a gas cooking top, an electric cooking top, a magnetic induction cooking top, a kitchen hood, a conditioner, a gas boiler, an electric water heater, an air conditioner, a hair dryer, an iron, a Hi-Fi system, a mixer or any other electric kitchenware, a lighting device, an alarm device.

38. (Currently Amended) The monitoring ~~device~~ system of claim 30, wherein said at least one physical quantity includes at least one of: temperature, flow rate, conductivity, weight, absolute humidity, relative humidity, pressure, linear displacement, linear velocity, linear acceleration, angular displacement, angular velocity, angular acceleration, chemical concentration, sound pressure, sound intensity, light intensity, oscillation frequency, and oscillation amplitude.

39. (Currently Amended) The monitoring ~~device~~ system of claim 30, further

comprising:

an information storage means for storing the at least one piece of information in

the read and write memory.

40. (Currently Amended) The monitoring ~~device~~ system in claim 30, wherein the

household electric appliance is one of a laundry washing machine and a washing/drying

machine adapted to perform at least one wash treatment on textile items, said at least one

physical quantity being preferably at least one of the following: weight of the textile

items being present in the basket of the washing machine or the washing/drying machine,

flow rate of water supplied to the washing machine or the washing/drying machine,

temperature of washing liquid contained in a tub of the washing machine or the

washing/drying machine, and conductivity of the washing liquid drained by the washing

machine or the washing/drying machine, where the washing liquid comprises water and

at least one washing agent.

41. (Currently Amended) A monitoring ~~device~~ system for use with a household electric

appliance, the monitoring ~~device~~ system comprising:

      i.   a read and write memory storing a plurality of measurements of a

plurality of internal physical quantities, a plurality of external physical

quantities and a plurality of electrical quantities that are related to the

household electric appliance, said measurements being taken within a

predetermined time period during a treatment cycle, the storing of a

last measurement of a physical quantity causing the deletion of a first

measurement of said physical quantity;

     ii.   a first interface means to connect a dedicated external

communications network to a plurality of external physical sensors,

which measure one or more of said plurality of external physical

quantities, and further having means for coupling a plurality of internal

physical sensors for measuring one or more of a plurality of internal

physical quantities ~~an internal physical quantity of the household~~

16   ~~electric appliance~~, where the one or more internal <u>physical</u> sensors are

17   connected to the monitoring device by way of an electronic control

18   means and the first interface means;

19   iii.   a means for measuring at least one electric quantity by measuring an

20   electric current running through the monitoring device;

21   iv.   a microcontroller configured to:

22   a)   process measurements of a combination of one or more <u>of said</u>

23   internal physical quantities, one or more external physical quantities, or

24   both, and one or more electric quantities to determine at least one piece of

25   information relating to or being employed in said treatment cycle during

26   operation of the household electric appliance, where the at least one piece

27   of information includes at least one of: functional information, statistical

28   information, and diagnostic information relating to the household electric

29   appliance by comparing a value of ~~said physical~~ <u>at least one of physical</u>

30   <u>internal quantity and at least one electrical</u> quantity with one or more

31   predefined values that relate to values for the treatment being performed

32   by the appliance at an instant in time;

33   <u>b)   drive an electronic control means which functions to adapt the</u>

34   <u>operation of the household appliance based upon the data detected by</u> ~~the~~

35   <u>said external physical sensors and said internal physical sensors;</u> and

36   ~~b)~~<u>c)</u>   extrapolate from said plurality of measurements of said at least one

37   physical quantity a data packet representative of the evolution of said at

38   least one physical quantity within said predefined time period over one or

39   more treatment cycles; and

40   v.   an information storage means for storing the at least one piece of

41   information in the read and write memory.

1   42. (Currently Amended) The monitoring ~~device~~ <u>system</u> of claim 41, wherein the first

2   interface means is an electric cable to the one or more external sensors.

43. (Currently Amended) The monitoring ~~device~~ system of claim 41, wherein the first interface means is wirelessly connected to the communication means.

44. (Currently Amended) The monitoring ~~device~~ system of claim 41, wherein the first interface means is wirelessly connected to the one or more external sensors.

45. (Currently Amended) The monitoring ~~device~~ system of claim 41, wherein the first interface means is connected to the first communication means.

46. (Currently Amended) The monitoring ~~device~~ system of claim 41, wherein the communication means and the one or more internal sensors are connected through an electronic control means, where the electronic control means collects, stores, and processes the measurements from the at least one physical quantity from the one or more internal sensors.

47. (Currently Amended) A system for monitoring a household electric appliance, the system comprising:

    a) a household electric appliance;

    b) one or more external physical sensors to measure a plurality of external physical quantities of the household electric appliance ~~.~~; a dedicated communications network that is coupled to said external physical sensors and is connected externally from said appliance to said network which transfers information to an associated microcontroller via ~~the~~ a first interface means;

    an electronic control means connected to one or more internal sensors, where the one or more internal sensors measure one or more physical internal quantities, or external sensors measuring one or more electrical quantities of the household electric appliance, the electronic control means configured to collect, store, and process measurements of the one or more physical and electrical internal quantities being internal measurements;

a communication means communicating with the electronic control means to transfer one or more of said internal measurements, over a predetermined time period to a first interface means on a monitoring device;

c) the monitoring device including:

    a. a read and write memory storing a plurality of measurements of said plurality of external physical quantities, a plurality of internal physical quantities and a plurality of electrical quantities, within a predetermined time period, the storing of a last measurement of said at least one quantity causing the deletion of a first measurement of said quantity;

    b. the first interface means to connect to the one or more external sensors and the said dedicated communication means network to receive the measurements of the one or more of said plurality of physical external quantities and the one or more physical internal quantities;

    c. a means for measuring at least one electric quantity by measuring an electric current running through the monitoring device;

    d. a timing unit to associate an instant in time at which the measurements of the one or more physical quantities and the at least one electric quantity are taken,

    e. a microcontroller configured to:

        (i)   process the measurements of the one or more physical external quantities with one or more physical internal quantities, and the at least one electric quantity, at the instant in time, to determine sensed information relating to the household electric appliance, where the sensed information includes: functional information, statistical information, and diagnostic information relating to the household electric appliance, said sensed information being a combination of values of at least one physical external quantity, physical internal quantity and at least one electric quantity with a

46   reference combination of physical and electrical quantities

47   being the combination that best represents the proper

48   operation of the appliance at that instant in time, and to

49   provide an electronic control means which functions to adapt

50   the operation of the household appliance based upon the data

51   detected by the sensors;

52   (ii)   collect information that allows the system to trace a history

53   of the monitored electric appliance that permits the

54   microprocessor to build in the read and write memory,

55   profiles being indicative of a trend within a predefined time

56   period of a particular physical quantity or typology of

57   information obtained by the microcontroller based upon

58   values detected by the said internal and external sensors; and

59   f.   a second interface means to send the at least one piece of information

60   to a remote center; and

61   g.   the remote center configured to collect the at least one piece of

62   information from one or more monitoring devices connected to respective

63   household electric appliances and to extract statistical information about

64   the household electric appliances being monitored.

1   48. (Previously Presented) The system of claim 47, wherein the remote center receives a

2   plurality of information sent by the monitoring device that the remote center collects and

3   sorts for the purpose of identifying at least one parameter related to the operation of a

4   washing machine or a washing/drying machine, the at least one parameter being

5   preferably at least one of the following: number of wash treatments performed by the

6   washing machine or the washing/drying machine within a predefined time interval,

7   quantity and typology of textile items loaded on average by a user for each wash

8   treatment, quantity and typology of washing agents loaded on average by the user for

9   each wash treatment, average quantity of water used by the washing machine or the

10   washing/drying machine for each wash treatment, and average electric energy absorbed

11 by the washing machine or the washing/drying machine for each wash treatment.

1 49. (Cancelled)

1 50. (Currently Amended) The system as defined in claim 30 <u>further comprising:</u> ~~wherein~~
2 ~~the external sensors include further comprising~~
3 _____ the external sensors having:
4   a flow sensor positioned along an associated inlet pipe and adapted to measure
5 water flow rate supplied to the washing machine; and
6   a conductivity sensor positioned along a drain pipe adapted to measure the
7   conductivity of washing liquid drained from the washing machine.

1 51. (Currently Amended) A system for monitoring a washing machine, comprising
2   a microcontroller configured to receive measurements from sensors associated
3 with the washing machine;
4   a flow sensor positioned along an associated inlet pipe externally to said washing
5 machine and adapted to measure water flow rate supplied to the washing machine;
6   a conductivity sensor positioned along a drain pipe adapted to measure the
7 conductivity of washing liquid as the liquid drains from the washing machine;
8   a dedicated communication network having a coupling to the flow sensor
9   and the conductivity sensor, said network being coupled externally of the
10   washing machine to the microcontroller; ~~and~~
11   <u>said microcontroller being further configured to adapt the operation of the</u>
12   <u>household appliance based upon data detected by said flow sensor and said conductivity</u>
13   <u>sensor; and</u>
           a read and write memory storing a plurality of measurements of at least one

physical quantity relating to the washing machine's operation, to provide a historical

analysis of the operation of the washing machine.